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Manubriosternal Osteomyelitis – Rare Cause of Acute Onset Chest Pain

ABSTRACT

The aim of this case report is to establish the role of radiology in diagnosing manubriosternal osteomyelitis – a rare cause of acute onset chest pain that is difficult to diagnose clinically and, most of the time, misdiagnosed as angina. Early diagnosis and timely management are clinically important to avoid fatal complications in the later stages of the disease.

Key words: Angina, Manubriosternal osteomyelitis, Steroids

INTRODUCTION

Acute onset chest pain is one of the most common clinical presentations among emergency cases. The most common etiologies are myocardial ischemia, pleuritic chest pain, gastroesophageal reflux disease, and costochondritis. Here, we present a rare cause of chest pain that can be misleading and difficult to diagnose in earlier stages – Manubriosternal osteomyelitis.

CASE REPORT

A 30-year-old male presented with acute onset diffuse anterior chest wall pain and tenderness for 3–4 days. No focal swelling was seen on examination. There was no history of trauma or any discharge. He did not report any history of fever or cough. He was on anabolic steroids to increase muscle mass. He denied a history of any major illness, injuries, tuberculosis, diabetes mellitus, or hypertension.

Physical examination revealed generalized tenderness and rigidity over the entire anterior chest wall. An electrocardiogram (ECG) showed a normal waveform. The initial laboratory investigations showed a normal hemogram with raised C-reactive protein.

Erect chest X-ray posteroanterior (PA) view was done – Left 1st rib anterior end and left sternoclavicular joints appeared irregular and widened as compared to right. A provisional diagnosis of costochondritis was made. Apart from these findings, a linear fibrotic band was seen in the left lower zone.

Contrast-enhanced computed tomography (CECT) of the chest was performed for confirmation of chest X-ray findings. A soft-tissue isodense area was seen in the anterior mediastinum. Significant fat stranding was seen in the mediastinum and subcutaneous regions of the anterior chest wall. Sternal attachments of bilateral pectoralis muscles and adjacent intercostal muscles appeared bulky with altered hypodensity suggestive of myositis. Minimal manubriosternal joint irregularity was seen. Ill-defined heterogeneously enhancing soft tissue was seen in the anterior mediastinum beneath the manubriosternal joint. Lungs and pleura were grossly normal. No mediastinal nodes were seen.

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These findings indicated the possibility of manubriosternal osteomyelitis > costochondritis. However, in view of soft-tissue inflammation being much more in proportion to bone erosions, a follow-up scan was suggested.

The following CECT thorax was done in 2 weeks. The patient was started on broad-spectrum antibiotics during this period. It showed increased manubriosternal joint erosions, a decrease in anterior mediastinal soft tissue, a decrease in mediastinal, subcutaneous fat stranding, and myositis. Tiny calcific foci are seen in the mediastinal soft tissue s/o resolving stage.

This confirmed the diagnosis of manubriosternal osteomyelitis.

Magnetic resonance imaging (MRI) of the sternum was done 1 week later to look for bone marrow changes and decide on further management.[1] T2/Short Tau Inversion Recovery hyperintense signal was seen in the manubriosternal joint, bilateral pectoral muscles, and intercostal muscles. T2 hypointense altered marrow signal intensity seen in adjoining manubrium and sternum bones. Minimal residual inflammatory changes were seen in the mediastinum.

DISCUSSION

This patient was clinically diagnosed as a case of angina pectoris in our emergency medical department. ECG and serum enzyme panels were normal. This, combined with chest X-ray findings, the young age of the patient, and the history of steroid use, made us think of musculoskeletal system pathology in this case.

Despite significant inflammatory changes in the first computed tomography (CT) – minimal bone erosions did not help in making a definitive diagnosis – forcing a follow-up scan. The progression of bony erosions established manubriosternal osteomyelitis as the primary pathology. Thus, it stresses the importance of a systemic approach and considering all possible differentials in case of acute onset chest pain to arrive at the correct diagnosis. Patients can be started on broad-spectrum antibiotics with early diagnosis to prevent complications.[2] Follow-up imaging is done to look for the progression of the disease. If no significant resolution is seen – tissue sampling followed by culture/sensitivity testing can be done. Risk factors for manubriosternal osteomyelitis include:

- Intravenous drug abuse – e.g., steroid (like in our case)[3]
- Diabetes
- Long-term skin infections
- Trauma induced
- Sickle cell anemia
- Autoimmune disorders

The most common pathogen is *Staphylococcus aureus*[2], psuedomonos.[4]

CONCLUSION

With this case report, we would like to stress manubriosternal osteomyelitis as a potential cause of acute onset anterior chest wall pain, especially in the young population. Subtle bone erosions make it difficult to diagnose earlier, causing diagnostic dilemmas and delays in appropriate treatment. Early MRI and CT can help in diagnosis.

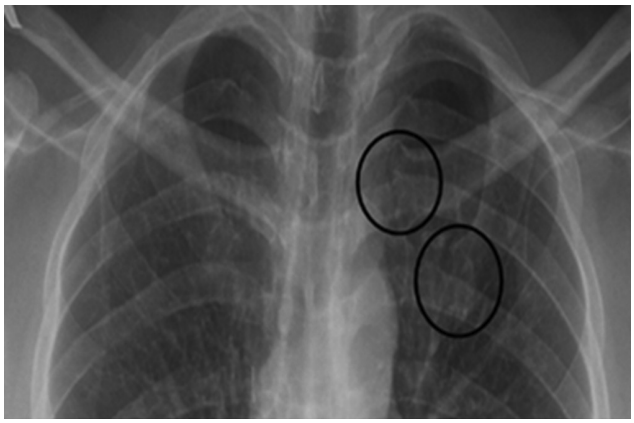
CLINICAL SIGNIFICANCE

1. A systematic approach to evaluating a patient with acute onset chest pain is essential to arrive at the correct diagnosis and prevent fatal complications
2. Manubriosternal osteomyelitis is a rare but difficult-to-diagnose condition with fatal complications presenting as acute onset chest pain.[5] CT and MRI are necessary in suspected cases to help in early diagnosis.

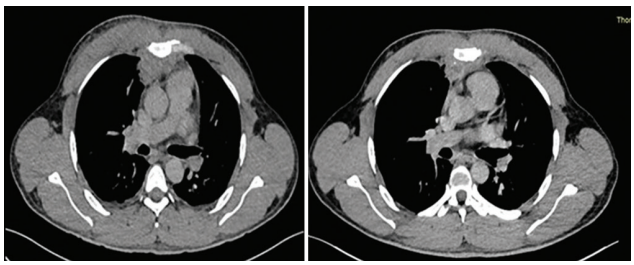
DIFFERENTIAL DIAGNOSIS

Differential diagnosis	Clinical and imaging features
Costochondritis	Inflammatory changes involving costochondral joint – chondral cartilage appears bulky with bony erosions in the adjacent anterior end of the rib.
Angina/ myocardial ischemia	Typical electrocardiogram changes with raised troponin levels.
GERD	An obese patient with a history of indigestion and altered eating habits. Can demonstrate hiatus hernia on imaging.
Pleuritic chest pain	Pleural pathologies involving asbestosis, infective pleural thickening, etc.

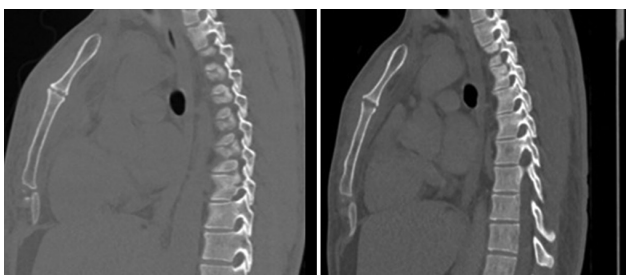
GERD: Gastroesophageal reflux disease



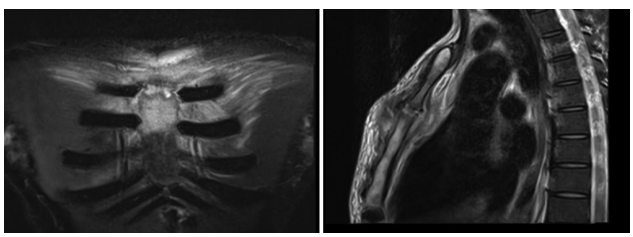
Chest X-ray PA view – Left 1st rib anterior end and left sternoclavicular joints appeared irregular and widened as compared to right.



Serial CECT axial images – Mild decrease in mediastinal soft tissue in follow-up scan (figure toward left – second scan, figure toward right – first scan).



Serial non-contrast CT sagittal images – Mild increase in manubriosternal joint erosions in follow-up scan (figure toward left – second scan, figure toward right – first scan).



MRI T2/STIR images show hyperintense signals in the manubriosternal joint, bilateral pectoral muscles, and intercostal muscles. T2 hypointense altered marrow signal intensity seen in adjoining manubrium and sternum bones.

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